Ordering number: EN 405D

Monolithic Linear IC

No.405D

LA3210

EQUALIZER AMPLIFIER WITH ALC

Features

- Low Noise Use.
- Wide automatic level control range.
- Good reduced voltage characteristics.

Maximum Ratings at Ta=25°C

			unit
Maximum Supply Voltage	V_{CC}max	15	V
Allowable Power Dissipation	$P_d$max	200	mW
Current Dissipation in Amplifier	I_{CC}max	3.0	mA
Allowable Current in ALC Transistor	I_6max	3.5	mA
Operating Temperature	Topr	-20 to +80	°C
Storage Temperature	Tstg	-40 to +125	°C

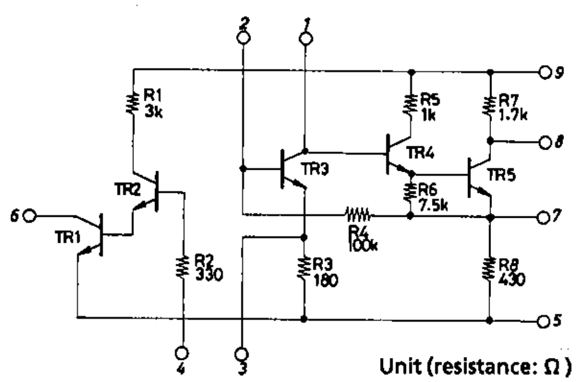
Operating Conditions at Ta=25°C

			unit
Recommended Supply Voltage	V_{CC}	5	V
Recommended Load Resistance	R_L	5.1k	ohm

Operating Characteristics at Ta=25°C, V_{CC}=5V, R_L=5.1kohms, Rg=600ohms, f=1kHz, See specified Test Circuit.

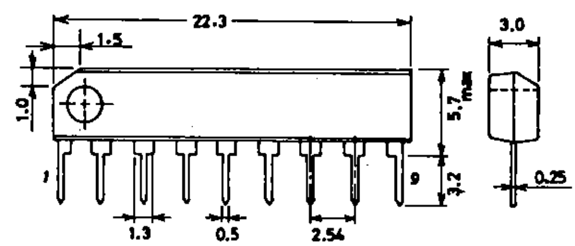
			min	typ	max	unit
Current Dissipation	I_{CC}	v_i=0, ALC off		1.4	2.0	mA
Voltage Gain	VGO	Open loop	66	69		dB
	VG	Closed loop	33	35	37	dB
Output Voltage	V_O	THD=1%	0.7	1.0		V
Total Harmonic Distortion	THD	V_O=0.2V		0.1		%
Input Resistance	ri		60	100		kohm
Equivalent Input Noise Voltage	V_{NI}	R_g=2.2kohms, NAB		1	2	uV
ALC Transistor Saturation Voltage	V_{sat}			75	100	mV

Equivalent Circuit



Unit (resistance: Ω)

Package Dimensions
(unit: mm)
3017B

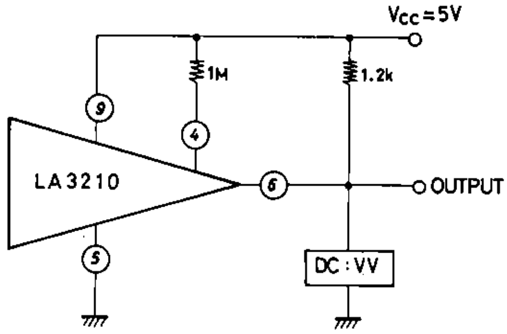


SANYO:SIP9

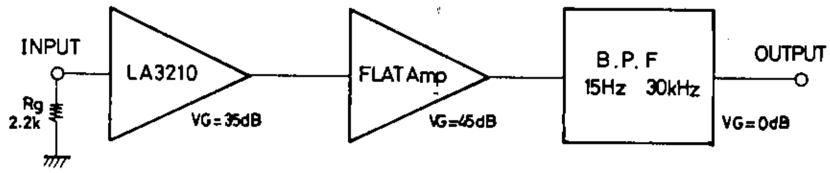
SANYO Electric Co., Ltd. Semiconductor Business Headquarters
TOKYO OFFICE Tokyo Bldg., 1-10, 1 Chome, Ueno, Taito-ku, TOKYO, 110 JAPAN

Test Circuit

·ALC saturation voltage

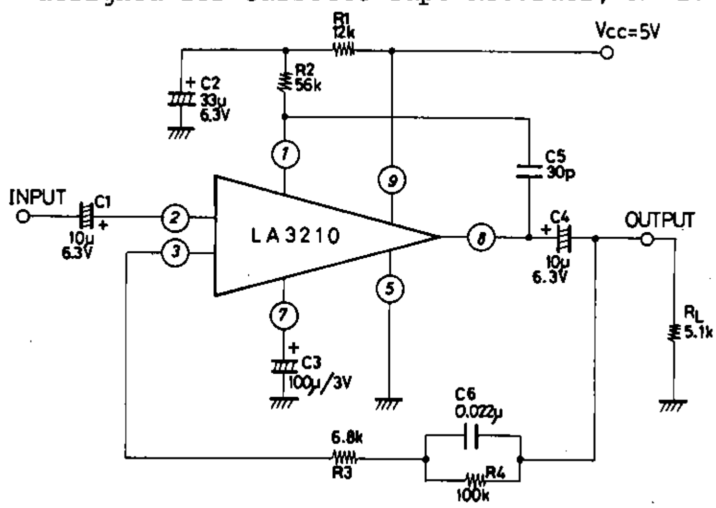


·Noise voltage



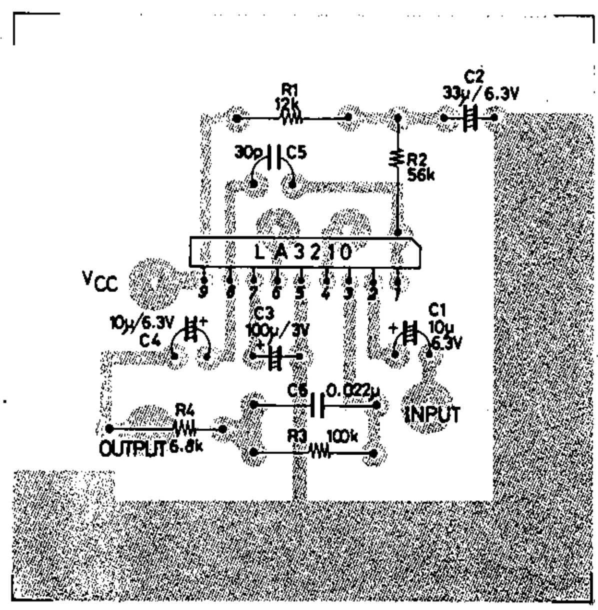
Unit (resistance: Ω)

■ Sample Application Circuit: Equalizer Amplifier with Automatic Level Control designed for Cassette Tape Recorder, Radio



Unit (resistance: Ω, capacitance: F)

Sample Printed Circuit Pattern
(Cu-foiled side, 60 x 60mm2)



Unit (resistance: Ω, capacitance: F)

Description of External Parts

C1: Input coupling capacitor (10uF)
DC current blocking capacitor used to prevent the DC current applied to the base from mixing in the AC signal source
The C1 is calculated using $C1=1/2\pi f_T z_i$ (z_i: input resistance, f_T: low cutoff frequency). If the capacitance value is too decreased, your set is subjected to inductive hum. We recommend using a capacitor of 2.2uF or greater.
We also recommend using 6.3WV or greater because the chemical capacitor becomes less leaky as the withstand voltage gets higher.

C2: Decoupling capacitor (33uF)
Used to bypass the power source ripple.
Decreasing the capacitance value makes the starting time shorter. We recommend using a capacitor of 33uF.

C3: Bypass capacitor (100uF)
Used to AC-short the emitter resistance and prevent AC components from being fed back to the input

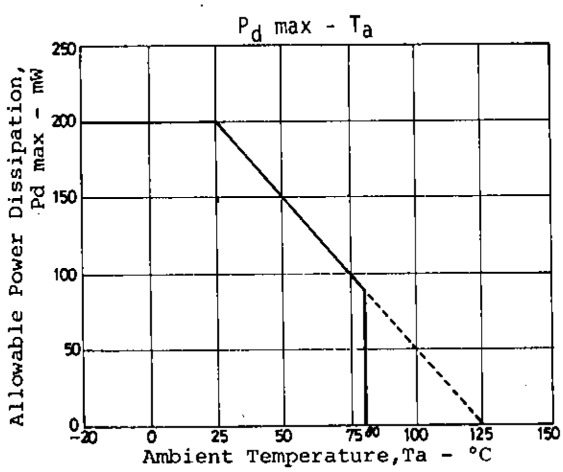
C4: Output capacitor (10uF)
Used to block DC components and pass AC components only
The C4 is calculated using $C4=1/2\pi f_L.R_L$ (f_L: low cutoff frequency, R_L: load resistance).

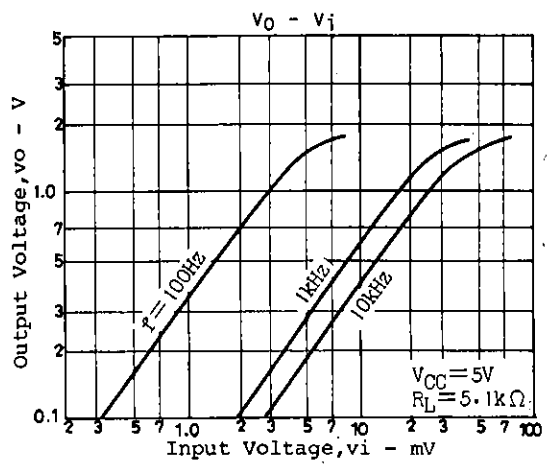
C5: Phase compensation capacitor (30pF)
Used to prevent high-frequency oscillation caused by phase shift when a deep feedback is provided. It should be noted that the high frequency response depends on the capacitance value of C5.

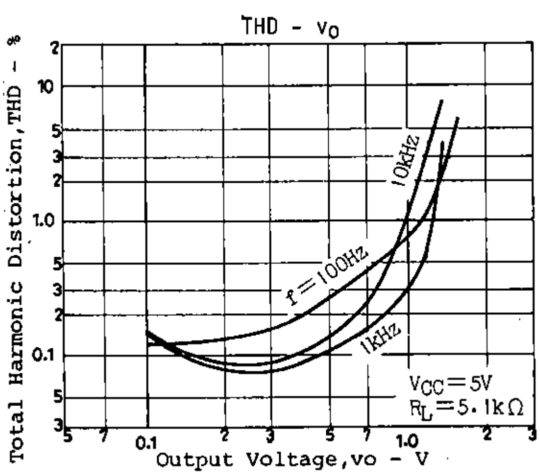
R1: Decoupling resistor used to bypass the power source ripple through C2.

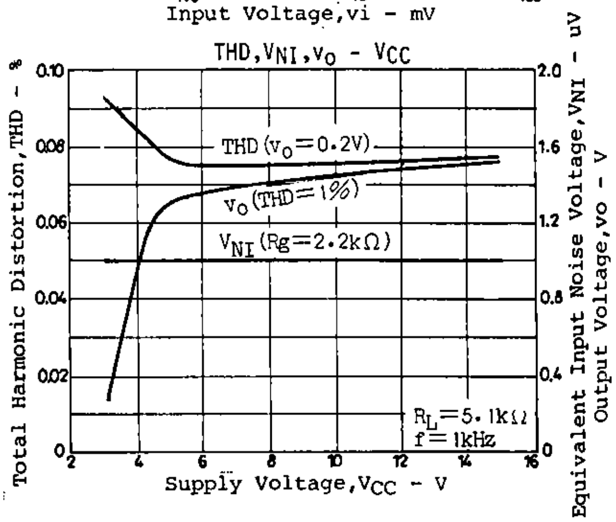
R2: Collector resistor of the first stage transistor of IC. Taken as load resistance in terms of AC.

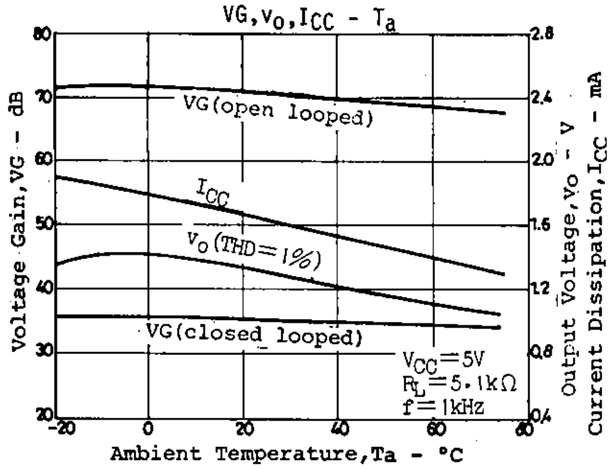
C6,R3,R4: Equalizer parts on which the closed-loop voltage gain depends. NAB 4.75 cm/s is provided.

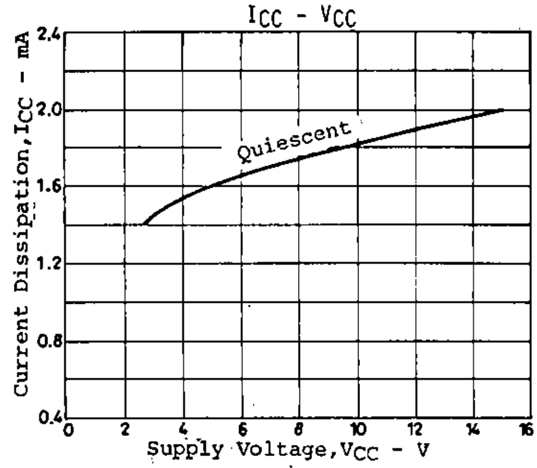


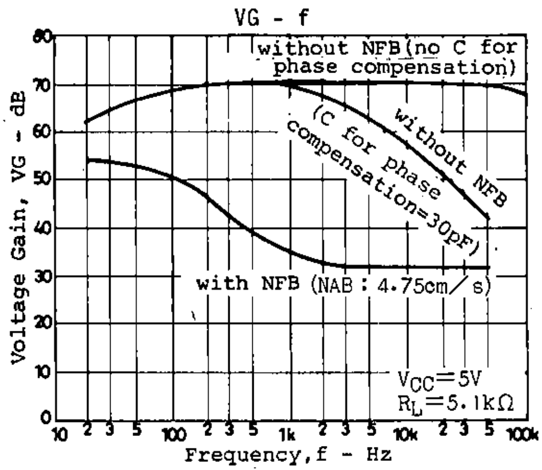


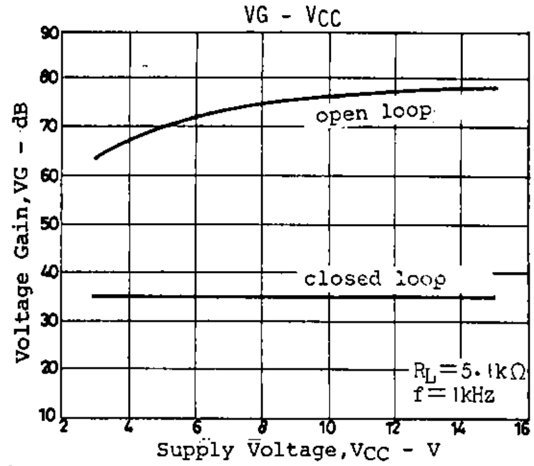


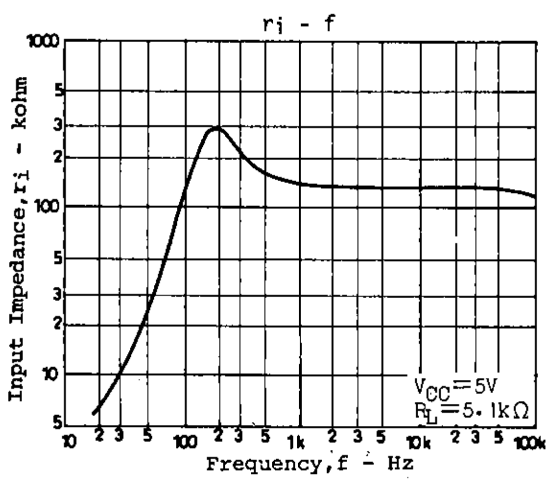


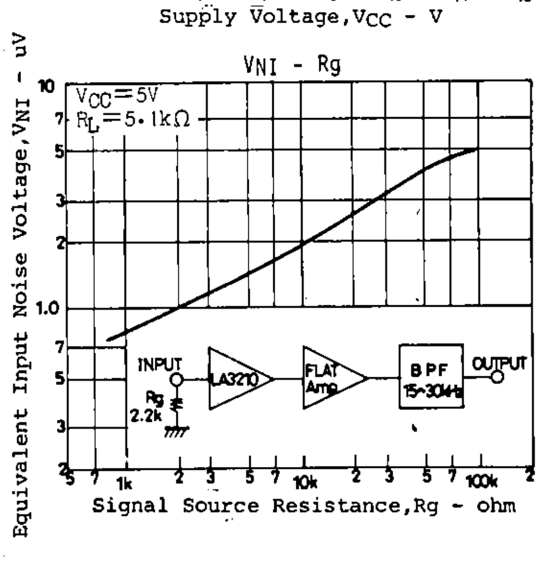












Proper Cares in Using IC

1. If the IC is used in the vicinity of the maximum rating, even a slight variation in conditions may cause the maximum rating to be exceeded, thereby leading to a breakdown. Allow an ample margin of variation for supply voltage, etc. and use the IC in the range where the maximum rating is not exceeded.
2. Pin-to-pin short
   If the supply voltage is applied when the space between pins is shorted, a breakdown or deterioration may occur. When installing the IC on the board or applying the supply voltage, make sure that the space between pins is not shorted with solder, etc.